# CWA General Requirements and Specifications

# "Revised June 2006"

# TABLE OF CONTENTS

# I. GENERAL PROCEDURES AND GUIDELINES

## A. GENERAL

The following guidelines are general in nature and can be used for initial planning and coordination. Each request for water service should address the following guidelines at a minimum. The water service connection shall also meet the applicable requirements of Sections II and III. Connection plans shall be developed for each request based on the specific conditions and requirements.

## B. APPROVAL PROCEDURE

1. For CWA Raw Water (contract or not), the customer is coordinated through the **City of Houston (COH) Contract Water Section of Utility Customer Service (UCS).** Potential CWA raw water customers should contact **UCS** and provide the following information in writing:
   a. Nature of service (raw; contract or not; treated w/contract);
   b. Physical location of point of service – street address at which service is required; location on key map, if possible;
   c. Demand (MGD or gallons per minute, with daily peak, hourly peak, normal daily flows);
   d. Term – start date, duration of service;
   e. Customer contact: name, address, telephone and fax.
2. On receipt of above and subject to the availability of water, **UCS** will send customer a draft contract and letter to contact the **Coastal Water Authority (CWA)** regarding tap location/requirements and the **COH Meter Shop** for meter location and type.

3. **COH Meter Shop**: Provides information to customer regarding appropriate meter(s), engineering drawings (by PE) of meter and tap locations on Texas coordinates and meter inspection of existing meters, if any.
4. **COH Water Engineering** reviews all drawings, assists Meter Shop in evaluation of drawings for tap and meter location and determines and advises UCS if any special clauses are needed in the contract.
5. **COH Water Production Division** reviews and approves customer backflow/air gap and conservation plan and advises UCS if any special clauses are needed in the contract.
6. **CWA**, after notification by customer per Paragraph 2 above, will arrange meeting in field, if necessary, to assist in identifying the connection location and alternatives. **CWA** reference drawing sheet numbers and **CWA General Requirements and Specifications** will be provided to the customer. The customer will be referred to the **CWA Engineer** for copies of drawings and design information needed to prepare engineer drawings. Preference is to use existing unused service valves. A Hop Tap on the CWA Prestressed Concrete Cylinder Pipe (PCCP) will be allowed only when a reasonable alternative cannot be found.
7. **Customer** making application for **CWA** raw water service will submit a written request for water service to the **Executive Director, Coastal Water Authority, 500 Dallas Street, One Allen Center, Suite 2800, Houston, TX 77002-4708**. The request will include three (3) copies of each of plan and profile drawings and specifications.
8. **CWA** and/or the **CWA Engineer** will review drawings and specifications and provide written comments and/or approval. Written approval from CWA will include a point of contact and phone number for notification prior to start of construction.

9. On return of signed contracts from customer, **UCS** coordinates staffing through several **COH** departments and **City Council** approval. **UCS** gives original signed contract to customer and advises **CWA** of final approval. **CWA** will allow construction to begin in accordance with approved plans and specifications.

## C. GENERAL GUIDELINES FOR HOT TAPS

1. **Hot Tap** – The procedures and materials for a hot tap of pre-stressed concrete cylinder pipe (PCCP) shall be in accordance with **Hanson Concrete Products** (formerly Gifford-Hill-American, Inc.) standards. A Hanson Concrete Products representative experienced with the hot tap procedures shall make the installation. A CWA representative shall also be present during the hot tap installation.
2. **Location of Hot Tap and Support of Existing Pipe** – The hot tap shall be located a sufficient distance from any existing pipe joint and it is recommended that the tap be located in the middle of the existing pipe length. The hot tap shall be located at or below the springline of the existing pipe to ensure recovery of the coupon. A cast-in-place concrete pipe support will be required under each pipe joint. The PCCP shall be excavated to the top of the pipe to locate the pipe joints. After the joints of the existing pipe have been located, the joints shall be excavated keeping the excavation for the pipe supports to a minimum so that the pipe bedding remains in place (see Control of Ground water below). After excavation of the pipe joints, a pipe support of sufficient size shall be installed under each joint to carry the load of the pipe, water and tapping mechanism. The pipe supports shall span across the pipe joint. After the installation of the pipe supports, the remainder of the pipe can be excavated. All excavation shall be conducted on both sides of the pipe, and may need to be staged so that an unbalanced loading

condition is not created. A one-foot (1') lift of cement stabilized sand may be required in the bottom of the excavation to provide a good footing for temporary support of the tapping valve and concrete placed support.

3. **Control of Ground Water** – The hot tap contractor shall provide the necessary measures to control the ground water from all sources. Since the bedding and pipe zone backfill for the CWA pipelines is sand, there is a potential for any groundwater present to run along the CWA pipelines into the excavation for the hot tap. The hot tap contractor shall provide the necessary measures to control the groundwater without the loss of pipe bedding material.

4. **Valves** – The tapping/gate valve shall be in accordance with AWWA C500 or C509. The tapping valve shall be provided with a valve support prior to tapping. Gate valves shall have a ductile iron body, 125 lb. flat-faced, flanged ends, cast iron double disc gate, bronze trim, non-rising stem, extension rod, a two-inch (2") AWWA square operating nut in lieu of an operating wheel, and a by-pass valve to equalize the pressure on both sides of the gate valve. CWA requires an additional valve (butterfly valve) for isolation on taps 24 inches and larger. The butterfly valve shall be in accordance with AWWA C504. Taps less than 24 inches can be provided with only a gate valve (RESILIENT-SEATED) in accordance with AWWA C509. Butterfly valves shall have a ductile iron body, Class 150B, short body valve with flanged ends, ductile iron disc, stainless steel seats and shaft, non-rising stem, extension rod, and a two-inch (2") AWWA square operating nut in lieu of an operating wheel. Bolting for all valves shall be in accordance with ASTM A307, Grade B with hexagonal heads. All buried valves shall be provided

with a vault. Coating on the valves shall be mortar. Force will not be applied to the Tapping Valve to align with extended piping.

5. **Routing of Service Line** – The routing of the service line across the CWA right-of-way shall be such that future pipelines to be installed by CWA are not impacted by the horizontal alignment and vertical profile of the service line. Criteria for the service line such as depths, clearances, etc. are given in Section III. The horizontal alignment and vertical profile of the service line will be evaluated on a case-by-case basis.
6. **Corrosion Protection** – The hot tap saddle, piping and valves shall be coated in accordance with the CWA piping to be consistent with the existing corrosion protection system. Mortar coating shall be required. If the service line piping material downstream of the hot tap piping and valves is electrically conductive such that corrosion may develop, an insulating flange gasket shall be provided between the hot tap piping/valves and the service line piping. If an insulating flange is provided, two test leads shall be installed on the pipe on each side of the insulating flange and brought to the ground surface at a test station mounted above ground.
7. **Thrust Restraint** - The service line owner shall assess and provide the necessary thrust restraint required by the hot tap arrangement.

## II. CONDITIONS GOVERNING CONSTRUCTION AND INSTALLATION OF FACILITIES AND IMPROVEMENTS ACROSS OR IN PROXIMITY TO CWA EASEMENTS

### A. GENERAL

1. All facilities or improvements constructed on CWA right-of-way shall be constructed and maintained in a manner that will avoid any conflict with CWA's existing facilities or future facilities. CWA may impose requirements in addition to those stated herein if in

CWA's opinion additional requirements are necessary to protect CWA's existing or future facilities.

2. The owner of any facility constructed on CWA right-of-way shall remove, lower, adjust and/or relocate any facility determined by CWA to interfere with CWA's use of CWA's right-of-way after being so notified by CWA in writing.
3. Vehicular crossing access shall be provided to CWA at all times across any and all such facilities or improvements.
4. Any and all such facilities or improvements shall be installed at as near an angle of ninety degrees (90°) to the longitudinal boundaries of CWA's right-of-way as is reasonably practical for the type of facility or improvement being installed or if in existing pipe corridor, installed at the same angle as existing pipeline crossing.
5. A wastewater treatment plant unit, wastewater pumping/lift station, or land where surface irrigation using wastewater effluent occurs must be located a minimum horizontal distance of 500 feet from CWA or COH open canal supplying raw water for sources of public drinking water.

## B. PLAN AND PROFILE DRAWINGS

1. Three copies each of plans and specifications for any proposed facility shall be provided to CWA. Utility crossings shall include plan and profile drawings of the proposed crossing. Size of pipe and casing, type and class of pipe, type of joints and contents to be carried must be designated. The location of the facility or crossing will be shown with respect to the CWA stationing showing appropriate stationing and angles of intersection. All vertical dimensions shall be equated to the CWA datum. The crossing should be as

nearly perpendicular to the CWA pipeline as practicable. A general physical description and address of the crossing location should be included in the crossing request.

## C. RECORD DRAWINGS

1. Submit record drawing with as-built plan and profile showing Texas State Plan Coordinate NAD 27 grid and scale factor at both ends of the casing or change direction of casing crossing. The vertical elevations at the end of the casing and any changes in direction shall be tied to CWA's vertical data. As-built record drawing location and coordinate values shall be provided to CWA at the conclusion of the project.

## D. UNDERGROUND LINES, PIPELINES, CONDUITS OR CABLES

1. All underground lines, pipelines, conduits or cables installed above CWA's facilities, as provided below, will be installed in steel casing extending the full width of CWA's right-of-way. The casing will be coated, wrapped and electronically isolated from the carrier pipe. Casing vents will be located outside of CWA's easements.
2. The bottom of the casing for any and all underground lines, pipelines, conduits or cables to be installed above CWA's facilities will be placed so as to provide across the entire width of the CWA right-of-way at least eighteen inches (18") of vertical clearance above the top of the highest of CWA's facilities.
3. All underground lines, pipelines, conduits or cables to be installed below CWA's facilities per Section III and Section IV with a minimum of three feet (3') of vertical clearance between the top of casing and the bottom of the lowest of CWA's facilities.
4. Excavation for underground facilities shall be backfilled per Section III.F and Section IV.E.

5 Underground lines, pipelines or conduits shall be cathodically protected. A test station with test wires connected to each structure will be installed at each crossing. This test station shall be monitored annually. Joint interference testing shall be conducted by all owners. If cathodic protection interference is found to exist, the owner of each facility will work together to resolve all such interference.

## E. ABOVEGROUND LINES, PIPELINES, CONDUITS, CABLES OR POLE LINES

1. Provide and maintain twenty-five feet (25') of clearance between the lowest point on any such lines, pipelines, conduit, cable or pole line and existing natural ground.
2. Supports for such facilities will be located outside of CWA's right-of-way.

## F. ROADWAYS

1. Provide and maintain a minimum of five feet (5') of earth cover, or as determined by CWA's Consultant Engineer, above CWA's underground facilities.
2. Stabilize subgrade with lime to a depth of six inches (6") for width of roadway and shoulders.
3. Flexible pavement will be provided with compacted, stabilized, flexible base material not less than eight inches (8") thick.
4. Concrete pavement will not be less than six inches (6") thick, and will be reinforced with steel wire mesh in accordance with State of Texas Department of Highways and Public Transportation standard specifications.
5. No vehicle will be placed or operated on CWA's easement that will have the net effect of producing a surface loading exceeding that which is equivalent to the standard H-20 loading as defined by A.A.S.H.T.O.

## G. RAILROADS

1. Provide and maintain a minimum of five feet (5') of earth cover, or as determined by CWA's Consultant Engineer, above CWA's underground facilities.
2. Stabilize the roadbed subgrade with lime to a depth of six inches (6").
3. Provide under ballast a minimum of ten inches (10") of cement stabilized sand fill with five percent (5%) by weight of Portland cement.
4. Provide a minimum of six inches (6") of crushed rock ballast below rail ties.
5. No railroad vehicle shall be placed or operated on CWA's right-of-way which will have the net effect of producing a loading on the CWA pipeline exceeding the design load capacity of the CWA pipeline. Additional works may be required by CWA to prevent overloading the CWA pipeline.
6. Provide and maintain a heavy-duty plank grade crossing for use by CWA.

## H. SURFACE STATIC LOADS AND MATERIAL STORAGE

Storage of materials or placement of surface static loads, other than as set forth under F and G above, will not be allowed within CWA's easement, except that with the written permission of CWA, they may be placed in areas outside of the area subtended by two planes extending upward at an angle of forty-five degrees (45°) above the horizontal from the center of the buried pipeline to intersection with the natural ground line.

## I. DITCHES

No ditches will be permitted on CWA's right-of-way.

## J. CWA STAFF, CWA'S CONSULTANT ENGINEER, PIPELINE OWNER'S REPRESENTATIVES AND CONSTRUCTION INSPECTORS

1. A pre-construction conference between representatives of CWA, CWA's consultant Engineer, the Pipeline Owner's representatives and Construction Inspectors will be required before any work commences on the CWA right-of-way.
2. The pipeline owner shall assign a qualified inspector to be on site at all times during the performance of construction operations directed at crossing CWA's rights-of-way. The inspector shall order the cessation of the work when so requested by CWA's field inspector.
3. The pipeline owner shall keep CWA's representatives advised at all times when working adjacent to or across CWA's rights-of-way. No work shall be done on CWA's right-of-way in the absence of CWA's representatives unless otherwise authorized.
4. Each crossing approved by CWA may have special specifications, in addition to these standard specifications concerning clearances, dewatering, boring operations, open trenching, shoring, earth slides, settlement and any other anticipated construction problems.

## K. ADMINISTRATION AND CONSTRUCTION INSPECTION FEES

There will be a fee in the amount of three hundred and fifty dollars ($350.00) for all pipeline crossings of CWA right-of-way to be paid by corporate check **PRIOR** to the start of construction activities. ***BANK DRAFTS ARE NOT ACCEPTABLE.***

# III. SPECIFICATIONS FOR UNDERGROUND PIPELINES AND OTHER UTILITIES CROSSING THE DISTRIBUTION SYSTEM

## A. GENERAL REQUIREMENTS

1. Minimum ground cover between finished grade or natural grade, whichever is lower, and the top of the crossing utility shall not be less than three feet (3').
2. Crossing utility shall be installed at a constant depth across the CWA right-of-way.
3. The following requirements are in addition to the requirements given in Section II.

## B. CROSSING OVER CWA FACILITIES

1. Pipe and casing shall be capable of spanning a 40-foot wide open trench.
2. Crossing lines shall not pass directly over a vertical curve overbend in the CWA line.

## C. CROSSING UNDER CWA FACILITIES

1. Vertical clearances shall be as shown below. However, additional clearance from initial CWA installation may be required to accommodate planned larger CWA lines.
   a. 3'- 0" minimum if cased.
   b. 5'- 0" minimum if uncased. (Uncased lines may be allowed on a case by case basis with separate approval by CWA).
2. Installation of pipelines and casings under existing CWA lines shall be accomplished by means of the boring process. Directional drilling must be at a minimum depth of 5' below CWA pipelines for the entire width of the right-of-way. Boring and casing, or boring and installation of carrier pipe shall be accomplished in one simultaneous and continuous operation.

   Pits for boring equipment on each side of the CWA line shall not be closer to the centerline of the CWA line than the intersection of a 1.5H:1V sloped line from the top centerline of the CWA line to the bottom of the proposed excavation. Pits shall be

shored such that lateral support to CWA facilities is continuously provided in all instances. Dewatering operations, if required, shall be conducted so as to direct water away from the CWA right-of-way. Casing, if used to facilitate boring, shall be coated and insulated from the carrier pipe.

### D. MARKER SIGNS

Marker signs showing pipeline depths shall be installed on casing vents or treated timber posts if casing vents are not provided.

### E. SPOIL MATERIALS OR EQUIPMENT OVER CWA PIPELINES

No spoil or other materials shall be placed over CWA lines. No equipment shall be operated over CWA lines that would produce a surface loading exceeding AASHTO H-20.

### F. EXCAVATION BACKFILL REQUIREMENTS

All excavations shall be backfilled to original ground level with suitable fill materials as authorized by CWA. Backfill shall be placed in 9-inch (9") maximum loose lifts and compacted to a minimum density equal to the surrounding natural soil.

## IV. SPECIFICATIONS FOR PIPELINE CROSSINGS OF THE MAIN CANAL, CEDAR POINT LATERAL, LATERAL CANALS, AND THE CITY OF HOUSTON (COH) WEST CANAL

### A. MINIMUM GROUND COVER

Minimum ground cover between finished grade or natural grade, whichever is lower, and the top of the casing shall not be less than five feet (5') at any point beneath any canal or lateral including the embankments, and not less than three feet (3') beneath any other point within the CWA rights-of-way. Directional drilling must be a minimum depth of 5' below the CWA canal for the entire width of the right-of-way.

## B. PIPELINE CROSSING REQUIREMENTS

All pipelines shall cross below the canals or lateral canals and shall be cased with new steel pipe for the full width of the CWA right-of-way, unless special permission and easements are granted by CWA for "dog-leg" crossings, in which case that portion of the pipeline which lies outside the canal embankment, parallel to and within CWA right-of-way, need not be cased. Casings shall be vented with vents to be placed outside of CWA right-of-way unless special permission is granted by CWA to place vents within the CWA right-of-way.

## C. INSTALLATION OF PIPELINES AND CASINGS

Installation of pipelines and casings under the existing canals shall be accomplished by means of the dry boring process or approved directional drilling. Boring and casing shall be accomplished in one simultaneous and continuous operation. Pits for boring equipment on each side of the canal shall not be closer to the canal centerline than the intersection of a 1.5H:1V sloped line from the outside top of the canal levee to the bottom of the proposed pipeline. Pits shall be so constructed that lateral support to CWA property is continuously provided in all instances. Dewatering operations, if required, shall be conducted so as to direct water away from the CWA right-of-way. Open trench methods may be utilized at crossings of the lateral canals, provided the flow of water is not interrupted and where canals have not yet been constructed.

## D. REMOVAL OF ABANDONED PIPELINES, CASINGS AND VENTS

Pipelines, casings and vents outside the canal embankment limits that are abandoned by relocation shall be excavated and removed from within the canal right-of-way at the time of relocation. The portion of abandoned pipelines and casings within the canal embankment limits shall be filled with grout and left in place under the canal and embankments, provided

the casing does not present an obstruction to the operation and maintenance of the canal. The grout shall be a sand-cement mixture with a minimum content of 1 1/2 sacks of cement per cubic yard of grout. All such excavation within the right-of-way shall be backfilled and compacted in accordance with the requirements of paragraph (E) below.

**E. EXCAVATION BACKFILL FOR PIPELINE INSTALLATIONS OR RELOCATIONS**

All excavations for pipeline installations or relocations shall be backfilled to original ground level with suitable fill materials as authorized by CWA, placed in nine-inch (9") maximum loose lifts and compacted to ninety-five percent (95%) of maximum density at optimum moisture content, plus or minus three percent (3%) as determined by A.S.T.M. Designation D6988 - latest edition. Tests of compacted earth may be performed by the Engineer or by an independent testing laboratory under the supervision of the Engineer to assure compliance with this requirement.

## V. ADDENDUM - INDEMNIFICATION REQUIREMENTS

The pipeline owner agrees to and does hereby, indemnify and defend CWA and its Officers, Directors, Agents, Servants, Representatives, Employees, Engineer and Attorneys (collectively referred to herein as the "Indemnified Parties") from and against any and all suits, demands, or claims and all costs, losses settlements (voluntary or otherwise), liabilities, expenses and judgments incurred in connection therewith, including attorney's fees and court costs; whether arising in equity, at common law or by statute (including the Texas Deceptive Trade Practice Act or other similar statutes), or under the law of contracts, torts (including without limitations negligence or strict liability without regard to fault) including without limitation all claims, demands and suits for damages or injuries, including death to any and all persons or property, whether real or asserted, based upon, in connection with, resulting from or arising out any action

or omission whether negligent or otherwise on the part of the pipeline owner or its agents, servants, representatives, employees and subcontractors. Such indemnification shall include workers' compensation claims of or by anyone whomsoever in any way based upon, in connection with, resulting from or arising out of the pipeline owner's work, and operations in connections herewith including operations of subcontractors engaged by pipeline owner, if any. Pipeline owner's contractual obligations of indemnification shall extend to and cover claims, demands and causes of action alleging acts of negligence, fault or other act or omission by or on the part of the indemnified parties. However, in the event that one or more of the indemnified parties are adjudicated at fault with respect to damage or injury sustained by a claimant, pipeline owner shall indemnify the indemnified parties only for that portion of the damage or injury adjudicated to have been caused by pipeline owner and/or its agents, servants, representatives, employees and subcontractors.

**ALL CROSSING AND FACILITY INSTALLATION REQUESTS, ALONG WITH PLANS, MAPS AND SPECIFICATIONS SHOULD BE SENT TO:**

**MR. GARY N. ORADAT, P.E.**
**EXECUTIVE DIRECTOR**
**COASTAL WATER AUTHORITY**
**ONE ALLEN CENTER, SUITE 2800**
**500 DALLAS STREET**
**HOUSTON, TEXAS 77002-4708**